Intelligent Automation Incorporated

Information Tailoring Enhancements for Large-Scale Social Data

Progress Report No. 1
Reporting Period: September 22, 2015 – December 15, 2015

Contract No. N00014-15-P-5138

Sponsored by
ONR, Arlington VA
COTR/TPOC: Dr. Rebecca Goolsby

Prepared by

Onur Savas, Ph.D.

<div align="center">

Progress Report No. 1

Information Tailoring Enhancements for Large-Scale Social Data

Submitted in accordance with requirements of
Contract #N00014-15-P-5138

Performance period: September 22, 2015 to December 15, 2015
(PI: Dr. Onur Savas, 301.294.4241, osavas@i-a-i.com)

</div>

1 Work Performed within This Reporting Period

In this reporting period, we performed the following tasks.

- **Delivered Task 1: Upgrades to Current Features of Scraawl and UI Improvements.** We have enhanced the responsive UI and added features to Scraawl. Task 1 is complete.

- **Started Task 2: Implementation of Temporal Analysis Algorithms for Advanced Analytics in Scraawl.** We designed the temporal analysis algorithms for both influence detection and community detection covering all aspects of front end, back end, and services. In particular, inputs to these algorithms will include the Tweet dataset (i.e., Scraawl report) and number of time fractions (e.g., 4). Implementation of Task 2 will be finished in the next reporting period.

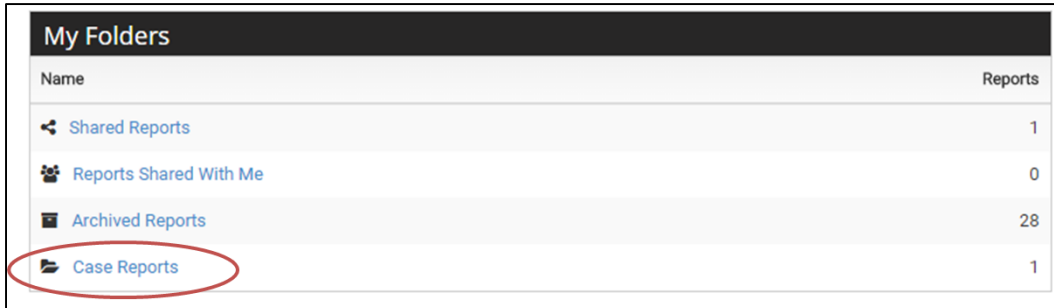- **Delivered Scraawl Version 1.9.4**.

1.1 Task 1: Upgrades to Current Features of Scraawl and UI Improvements

We have enhanced the responsive UI and added features to Scraawl. Next, we detail these enhancements and features.

1.1.1 Bookmarking and Case Report Capability

We have added a capability to bookmark a set of tweets and export them into a case folder, which is, for all practical purposes, another Scraawl report. The case reports are added part of "My Folders" in the "My Reports" screen and are shown along with "Shared Reports," "Reports Shared with me," and "Archived Reports" (see Figure 1).

Figure 1. "Case Reports" under "My Folders."

A user can bookmark a tweet or a set of tweets and then export these bookmarked tweets into a Case Report. The most convenient way to bookmark all tweets is to make a search under "Raw Data" and use "Bookmark ALL matching" under the "Bookmark" dropdown menu. Once a tweet is bookmarked, a bookmark symbol is shown to the right of the tweet before the date column.

The bookmarked tweets can then be exported into a "Case Report" by using the "Export Bookmarked" menu item under the "Actions" dropdown menu (see Figure 2).
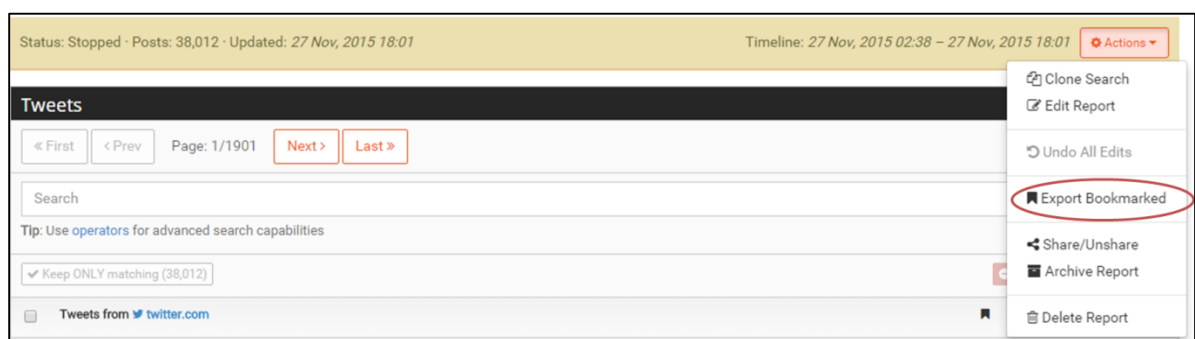

Figure 2. "Export Bookmarked" menu item.

1.1.2 Use of MapBox

MapBox is a mapping and searching service that is built on vector maps and rendered in real-time. IAI has integrated MapBox for location and heat maps, and made it available as part of Scraawl's geospatial analytics in addition to Google maps. A screenshot of MapBox

screen is shown in Figure 3. Similar to Google maps, the geo-coded, geo-referenced and geo-profiled tweets are shown. In addition, click/drag/filter (selecting the square icon and by drawing rectangles with mouse), zoom in/out (either with the +/- buttons or mouse wheel), home zooming, and editing/deleting selected regions are available. In addition, using the "magnifying glass" icon, a user can search locations/places, and the map automatically zooms into the selected region.
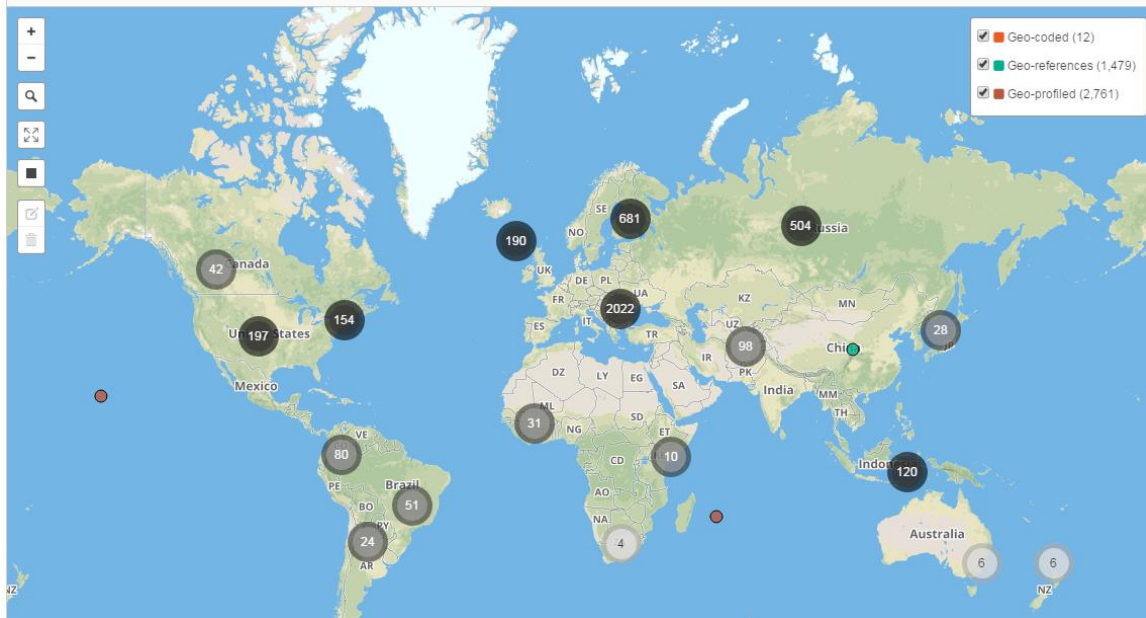

Figure 3. MapBox screen.

1.1.3   Enhancement of User Profiles

The user profile screen has been enhanced with additions to limits for data access and managed access to analytics. Specific submenus are as follows.

- **Basic Information:** Basic user information such as name and e-mail is shown here. Users can also change their password and change their time zone. If a user belongs to a group then that information is shown here as well.

- **Linked Accounts:** In addition to linking Twitter accounts, users can now link their Instagram accounts. This is encouraged because users can use their token (as opposed to shared IAI token) when using public APIs to collect data.

- **Report Limits:** Number of limits for search, active search, user, shared, archived search, archived user and case reports are shown here. These limits are based on user privileges.

- **Twitter Limits:** All limits and privileges regarding Twitter data collection is shown here.

- **Instagram Limits:** All limits and privileges regarding Instagram data collection is shown here.

- **Analytics Limits:** The availability of analytics for Twitter and Instagram is shown here. These privileges are based on user or group.

- **Manage Account:** Users can delete their account, in which case their data is deleted from IAI servers as well.

1.1.4 Translation of Words/Phrases in Searches

Per our agreement with Google, users can enter their words and phrases in one of the 90 languages and translate into/from them. This capability is provided in both basic and advanced searches.

1.1.5 Usability and Navigation Improvements

We have also made improvements to the usability and navigation. We improved the communication methodology in the UI so that the front end user interface gets notified of data changes in the backend. In particular we improved the efficiency of the JavaScript libraries that communicate with the backend data and analytics services and display the result to the end user. We made the front end user interface more efficient, responsive, and dynamic for the end user. This included making the UI render faster, the data fields being updated more frequently in an efficient manner. We also focused on improving the user interface for mobile devices by better adapting to the specification of the device that is requesting the data. We also improved the visualization of the analytics results so that the exploration of the results is more intuitive and accessible.

We also worked on improving the navigation process throughout the application so that mobile users can better interact with the interface. We reduced the number of steps a user may have to perform to achieve the desired outcome, in particular, on mobile devices. An example is improved "breadcrumbs" throughout Scraawl. We improve the user's contextual awareness throughout the application by improving the user's ability to navigate within and between data and analytical activities.

1.2 Task 2: Implementation of Temporal Analysis Algorithms

We designed the temporal analysis algorithms for both influence detection and community detection covering all aspects of front end, back end, and services. In particular, inputs to these algorithms will include the Tweet dataset (i.e., Scraawl report) and number of time fractions (e.g., 4). Based on these user provided parameters Scraawl will partition Twitter data into different time fractions (according to tweet post times), run Twitter analytics over each time fraction, and display how Twitter analytics results change over time.

Scraawl temporal analytics will strike a balance between data scalability and computation time. Analytics drilldown into each time window will also be provided. Customized user interface will be developed to display temporal changes in analytics results (e.g., changes in communities over time).

2   Current Problems

None.

3   Work to be Performed in the Next Reporting Period

In the next report period, we will focus on the following tasks:

- We will finish implementation of Task 2.
- We will finish Task 3.
- We will deliver Scraawl 1.9.5.

4   Financial Status

Financially, we are in good shape.